

Late Miocene Submarine Volcaniclastic Deposits Derived from Subaerial Caldera Eruptions

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Late-Miocene subaqueous volcaniclastic deposits derived from a subaerial caldera were observed at Sendai, northeast Japan. Several units of graded volcaniclastic deposits stacking with a layer of peperite in an outcrop are interpreted as syn-eruptive subaqueous deposits. The characteristics of the graded volcaniclastic deposits is similar to that of the unit studied by Cashman and Fiske (1991), with a clast-rich, poorly sorted breccia at the base, overlain by diffusely stratified pumiceous breccia and sand stone, and cross-bedded sandstone at the top. Clast components in the deposits are homogenous in some units (pumice) and bi-modal (dense basalt and pumice) in the others. The deposits are correlated with pumice flow from a subaerial caldera that should have been closed to the shore. The products of the caldera eruptions are basalt-clast-bearing pumice flows and basalt-clast-free pumice flows. The basalt clast was caused by collapse of basalt lava that had effused at the rim of the caldera during the caldera formation. The pumice flows entered the sea or the subaerial deposits reworked into the sea.